WAINS

WAINS GmbH | Whitepaper

Digital Pest Monitoring: The Role of IoT Technology in Pest Control

#pest_control_goes_digital

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Preface

Pest control has never been as fascinating as it is today!

Pest control is an indispensable part of healthcare, the food industry, and facility management. Traditionally, pest controllers relied on proven yet time-consuming methods to monitor and control pests. However, in an era of rapid technological advancement and increasing connectivity through the Internet of Things (IoT), new horizons are opening up for pest control.

In this whitepaper, we delve into the exciting world of digital pest monitoring and shed light on the pivotal role that IoT technology plays. WAINS GmbH is a professional in this revolutionary field, offering much more than just electronic traps. We present to you a comprehensive IoT system for pest control that not only enhances efficiency but also transforms the way we identify, monitor, and eliminate pests.

In the following sections, we will explore how digitization and device connectivity are transforming pest control. We will show you how you can benefit from this innovation, whether it's through seamlessly integrating IoT devices into your existing pest control system or using artificial intelligence to optimize preventive measures and minimize damage.

Our goal is to provide you with a holistic view of the future of pest monitoring and to demonstrate how WAINS GmbH is driving the industry forward. Join us in the world of digital pest management, where efficiency, precision, and sustainability go hand in hand. Welcome to the era of intelligent pest control IoT.

What is IoT?

#internet_of_things

IoT, short for the Internet of Things, is all about enabling different devices and objects to communicate with each other over the internet. Imagine your coffee maker, thermostat, or even your light bulbs having the ability to converse and exchange information; that's precisely what IoT makes possible. These devices are equipped with sensors and technology that allow them to collect, process, and share data with each other.

This gives rise to an intelligent network of interconnected devices, designed to simplify your life. With IoT, you can, for instance, transform your home into a smart living space. You have the power to control your appliances and home systems via a mobile app or voice commands. This means you can turn on the lights, adjust the room temperature, and much more with ease.

But IoT isn't limited to just everyday life; it also offers significant advantages in the realm of pest monitoring.

The Internet of Things (IoT): **The Evolution of Connectivity**

In recent years, the Internet of Things (IoT) has emerged as a groundbreaking technology, facilitating the interconnection of devices via the internet and ushering in transformative changes across various domains. The concept of IoT originated in the 1980s, but its true breakthrough occurred with the widespread accessibility of the internet. With the increasing availability of broadband connections and wireless technology, IoT continued to expand.

One of the initial applications of IoT was in the realm of Smart Homes, where household appliances were interconnected.

#internet_of_things

However, IoT also found its footing in industries, agriculture, and healthcare. Sensors and IoT devices were developed to collect data and automate processes. IoT has fundamentally altered the way we work and live.

Today, we find ourselves in an era of exponential IoT growth. Edge computing, artificial intelligence, and machine learning are being integrated to enable real-time analytics and automation at unprecedented levels. The future of IoT promises even deeper integration into our daily lives, spanning from autonomous vehicles to smart cities. IoT has embarked on an incredible journey and continues its unstoppable progress, holding vast potential across diverse sectors.

By connecting devices, infrastructure, and services, IoT can drive efficiency enhancements, improved security, optimized healthcare, sustainable urban environments, and advanced industrial processes. The Internet of Things will persistently transform our daily lives, leading us into a connected world where devices seamlessly communicate with one another and enhance our experiences.

Moving from Conventional to Digital Pest Management **An Overview**

The era of relying solely on manual inspections and reactive measures for pest control is a thing of the past. With the advent of digital technologies, the way pests are monitored and managed has undergone a radical transformation. Digital pest monitoring has emerged, opening up entirely new avenues for effective prevention and early detection of pest infestations.

Traditional pest control primarily relied on periodic checks conducted by pest control professionals, involving the inspection of traps, the placement of bait or the use of pesticides as needed. However, this approach was often time-consuming, inefficient, and prone to human error. Furthermore, tracking the progression of an infestation and evaluating the effectiveness of interventions was challenging.

The introduction of digital solutions has changed the game entirely. Digital pest monitoring harnesses modern technologies such as IoT devices, sensors, wireless networks, and cloud computing to enable continuous monitoring and analysis of pest activities. This allows for real-time pest detection, empowering pest control professionals to swiftly and precisely implement measures to contain infestations.

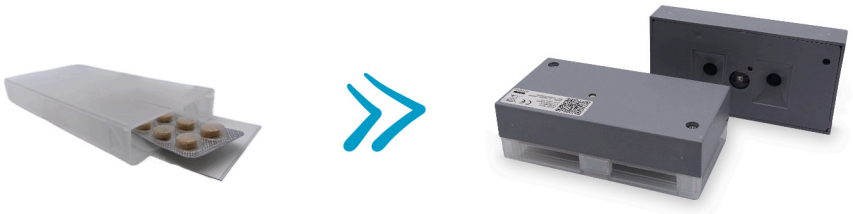
An essential component of digital pest monitoring is the use of smart traps and sensors equipped with a range of functionalities. These devices not only capture pest activities but can also record environmental variables such as temperature, humidity, and motion. This capability allows for the identification of potential causes of pest infestations and the implementation of preventive measures before they escalate into significant problems.

The data collected is securely stored in a cloud-based platform, accessible by pest control professionals, businesses, or other stakeholders at any time and from anywhere. By analyzing this data, trends and patterns can be identified, aiding in the prediction and proactive management of future pest issues.

Another significant advantage of digital pest monitoring is the saving of time and resources. Automated surveillance and targeted interventions eliminate the need for regular manual inspections. Pest control professionals can streamline their work processes, focusing on strategic tasks rather than continually checking traps.

Digital pest control has the potential to revolutionize the way we combat pests, enabling a preventive and proactive approach.

IoT is driving the digital revolution forward: **Digitalization of Pest Monitoring**



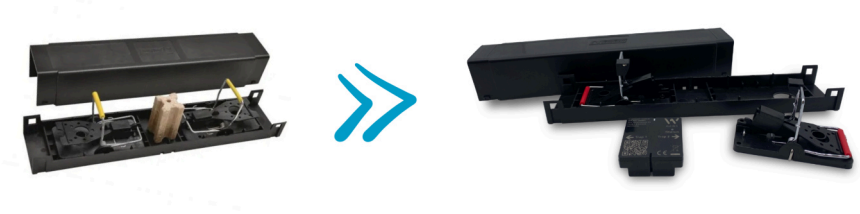
before → after

Welcome to the digital era of pest control! The days of laborious manual inspections are over. Technology now takes the helm, turning pest monitoring into a high-tech spectacle. With intelligent sensors, connected devices, and plenty of data, we stand at the forefront of the digital revolution.

Imagine being able to unmask pests with a glance at your smartphone or tablet. No more hours spent climbing ladders or crawling under shelves. With digital monitoring systems, we detect early signs of activity and pinpoint where pests are hiding, allowing for targeted control.

Manual inspections are giving way to a digital power play. Our sensors record temperature, humidity, and other device data, providing us with valuable insights. The best part? The data is transmitted in real-time over the internet to our central platform, where it's analyzed and visualized. This enables you to react immediately, take measures, and keep pests in check.

The digital revolution in pest monitoring brings us efficiency, precision, and control like never before. No more guesswork about where pests are hiding. We have the power of technology on our side and won't let pesky pests steal the show



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IoT in Insect Monitoring:
The Digital Revolution Continues

The possibility to interconnect individual devices enables companies in pest control to explore previously untapped business opportunities. This includes all areas where pests are present and fall under the scope of European Regulation 852/2004, which mandates pest monitoring. Pest monitoring, i.e., the assessment of insect infestations, is typically conducted and documented every four to eight weeks by trained pest control professionals, often electronically using software systems.

The often more than 100 insect monitors are distributed throughout the facility or the area to be monitored, and they are often located in hard-to-reach places. This can mean temporarily shutting down production when pest control professionals need to inspect the monitors. Furthermore, infestations are only discovered after pest control professionals have inspected the monitors, requiring both time and at least one person to be physically present at the insect monitors. Additionally, retracing the course of an infestation is challenging.

Moreover, there are situations where the entire production, such as in the food industry, may need to be halted for monitor inspections. This can happen, for example, when it's not feasible for pest control professionals to inspect the monitors during ongoing production due to their placement. Often, monitor inspections are combined with equipment maintenance, which entails increased organizational efforts. If the monitor inspection cycles (e.g., set every four weeks) do not align with maintenance intervals, the facility must be shut down solely for inspection purposes. A permanent, IT-based pest monitoring system can save costs in this regard. The system automatically detects whether pests are present in the insect monitors or if the cameras or adhesive sheets are soiled.

Therefore, pest monitoring offers significant potential for optimization through the use of digital solutions and the interconnection of insect monitors.

traptice® insect Digital Insect Monitoring
by WAINS

Insect Monitoring goes High-Tech!

With the power of IoT, our monitors become digital heroes in pest control. Sensors ensure they not only capture the state within the monitor but also track environmental variables. These data embark on a journey to the World Wide Web, where a central system processes and analyzes them. And the best part: When an infestation arises or a threshold is exceeded, the alarm is triggered instantly, and all team members in the system receive a prompt for action!

Thanks to the recorded environmental variables, we can identify the causes that facilitate infestations. Is the temperature or humidity rising in specific locations or within certain monitors? Bingo! We know that a potential infestation is lurking here. Our smart sensors never let us down and raise the alarm early. This allows us to proactively investigate the causes and implement appropriate countermeasures to make life difficult for these pests.

IoT in Rodent Monitoring: **Continuation of the Digital Revolution**

traptice® rodent

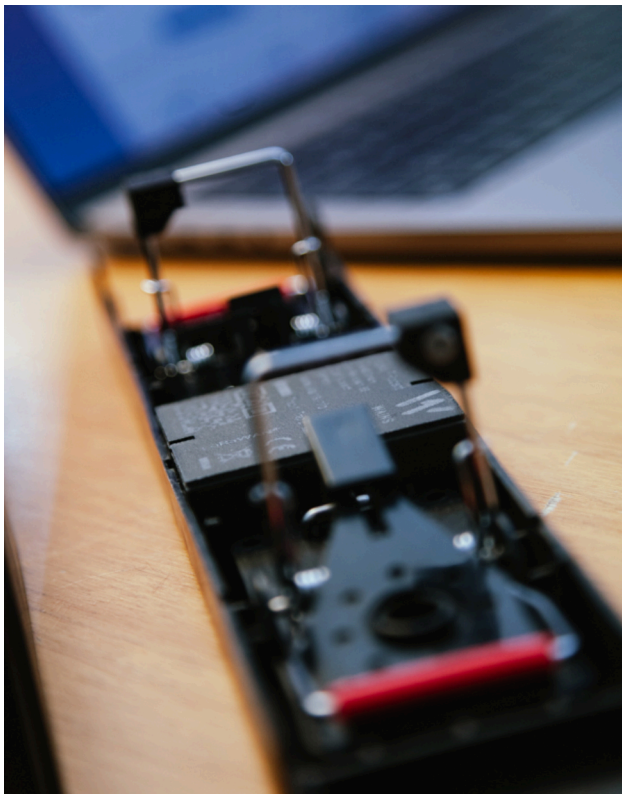
You are a pest controller and are all too familiar with the never-ending cat-and-mouse game. But now it's time to upgrade and fully leverage the digital revolution in pest management. Allow us to introduce you to the new generation of mousetraps and rat traps.

With our traptice® rodent Sensor, catching pests becomes a breeze. The magnetic sensor detects every trigger of the trap in real-time and immediately sends an alert. No more annoying waiting and guessing whether the trap has snapped or not. You'll know instantly and can act quickly.

But that's not all. Our traptice® rodent Sensor is designed to be so clever and slim that it fits inside the mouse tunnel, making the little troublemaker think there's an escape route in sight. A clever deception to lure the mouse into the trap.

Instant killing is not always guaranteed with snap traps. That's why it's important to regularly check the trap. But don't worry, thanks to our digital monitoring solution, you no longer have to inspect all traps every day. Our traptice® rodent Sensors keep you updated and notify you only when a trap has been triggered. This saves you valuable time in a world where time has become the most precious commodity.

The future of pest management is here, and it's digital. Equip yourself with our smart snap traps and keep the IoT revolution going. Put an end to the cat-and-mouse game and become a master of pest control. With traptice® rodent, you're always one step ahead!



Expanded Service Offering Through **IoT Platform**

The future of pest monitoring is being revolutionized by an innovative IoT platform. By capturing information from every installed monitor with a digital unit, plenty of valuable data is generated. However, to effectively utilize this data, it needs to be made accessible to the relevant users and applications. This is where the IoT platform comes into play, providing a secure network connection and transmitting the data to the cloud.

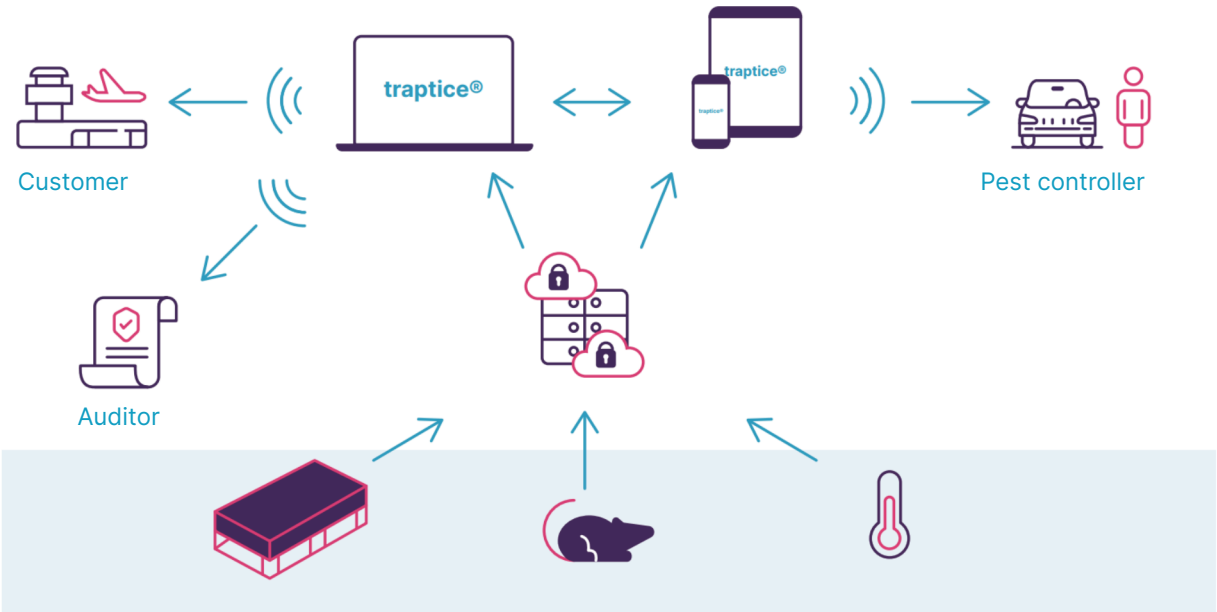
Security is a top priority in this process because the collected information could be highly sensitive. That's why leading cloud service providers offer dedicated environments for their customers. Each user receives a closed environment where data is isolated and protected from unauthorized access. Furthermore, user access rights can be individually restricted, allowing them to view only the monitors and information that are relevant to them.

The benefits of the platform go beyond traditional pest monitoring. Companies use it for centralized management of branches and pest controllers. Auditors gain access to monitors that require inspection and integrate information into reports.

The attractive visualization of the data allows for detailed analysis and rapid responses to changes. The platform also offers automated analysis and predefined actions. For example, it detects an excessive number of insects on adhesive traps and notifies the team.

The groundbreaking IoT platform optimizes pest monitoring. Companies retain control over pest control and proactively address issues to keep premises clean and pest-free.

The Eco-System - with traptice®



Advantages of Digital Pest Monitoring: **Efficiency & Intelligence**

Key objectives in pest monitoring include quickly identifying problems and preventing resulting issues. It is important to be able to understand which areas are experiencing a higher incidence of insects and pests and how to prevent them in the future.

From these goals, the requirement for a highly automated IT solution that can capture and process data at regular and short intervals, as well as initiate actions through Artificial Intelligence (AI), can be derived.

Through a smart connected device for pest monitoring, environmental variables such as humidity and temperature, as well as the condition inside the insect monitor via two camera modules, are recorded. The data is sent to the cloud platform at regular intervals, where it is automatically processed, visualized, and an alarm is generated when critical values are exceeded.

In addition to the number of captured insects, intelligent systems can recognize the captured insects in the images and classify them using Artificial Intelligence. When a critical insect is captured and recognized by the system, the pest controller is notified. They can immediately respond to the infestation and take the necessary steps to prevent further spread of the pest.

Furthermore, the pest controller requires less time on-site with the insect monitors since remote inspection of the smart monitors is possible at any time. This saves on-site work, travel time, materials, and personnel costs. Pest controllers can use these resources for other tasks or even new activities, such as dedicating more time to analysis and root cause investigation, uncovering reasons for the infestation, such as construction defects, incoming goods inspection, or weaknesses in the existing pest monitoring process.

For the user, the use of IoT devices offers significant advantages that they can incorporate into their service model, directly enhancing the quality of their work:

- Real-time analysis of insect monitors
- Utilization of cloud services on PC, tablet, and smartphone
- Reduced on-site personnel requirements for monitor inspections
- Hence, the opportunity to serve more customers and expand the customer base (= increased revenue)
- More time for customers due to the elimination of standardized tasks
- Location-independent deployment of IoT devices
- Documentation of infestations with trends and environmental factors
- Person-independent and automatic capture of relevant information
- No production downtime due to unnecessary checks of empty insect monitors
- Reduced effort in monitoring evaluation
- Simplified auditing
- Digitally enhanced work methods and modern processes

Advantages of Our Digital Pest Monitoring Solution

Discover the strengths of our digital pest monitoring solution

traptice® insect

- Wi-Fi connectivity
- Daily image monitoring
- Automatic insect counting
- AI classification
- Battery life of at least 1 year
- Splash-resistant
- Replaceable battery
- Easy installation via mobile app
- Setup via Bluetooth

traptice® rodent

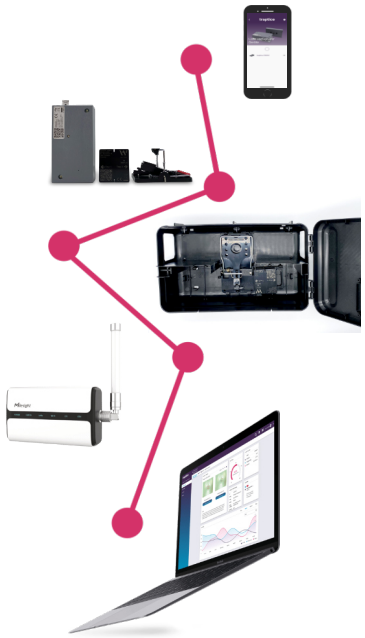
- LoRaWAN
- Direct notification upon triggering
- Compatible with common bait stations
- Extended range thanks to LoRaWAN technology
- Minimum 1-year battery life
- Splash-resistant
- Replaceable battery
- Easy installation via mobile app
- Setup via NFC
- Not a "single-use" trap

WAINS Cloud + App

- Compatible with common bait stations
- Dashboard
- Interface-ready for quick integration with documentation software
- Device management
- Multi-tenancy capability
- Role and rights management
- iOS and Android app
- Reading permissions for customers and management possible

LoRaWAN
3rd-party devices

- Integration of additional LoRaWAN sensors from third-party providers is possible, such as: Smart buttons, PIR sensors, Temperature sensors, Distance sensors and more
- This helps reduce data fragmentation as separate platforms for each device are not required.



Software Structure / Updates

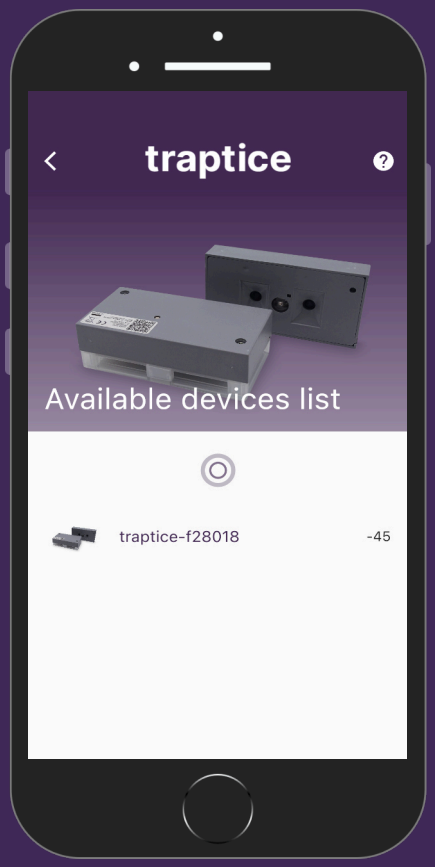
- Fundamental framework: Cumulocity/ Software AG IoT platform
- Regular platform enhancements
- Interfaces to documentation software possible
- Integration capability, e.g., with Microsoft Teams
- Easy integration of external software via webMethods.io

Advantage of Digital Pest Monitoring: **Efficiency through Automation**

One of the greatest strengths of digital pest monitoring is **process automation**. In the past, monitoring and controlling pest activities required time-consuming manual inspections and logging. With digital solutions, pest traps and devices can be equipped with sensors that automatically collect data and send it in real-time to a central platform. This eliminates the need for regular physical inspections, saving time and resources.

Another strength of digital pest monitoring is the ability for automated **alarm generation**. As soon as a pest event is detected, the system automatically sends alerts to the relevant individuals. This enables a rapid response and targeted measures to combat the pests, even before they can further spread.

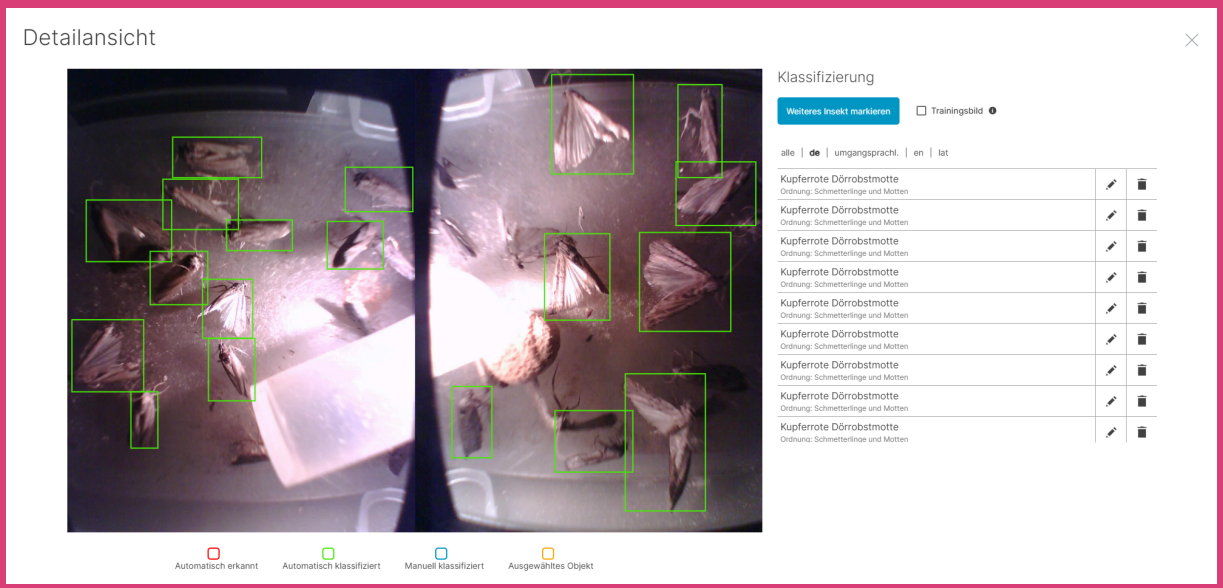
Furthermore, digital pest monitoring can offer **interfaces to documentation programs**. This allows for seamless integration of the collected data into existing documentation systems, facilitating reporting and monitoring of pest activities. Through the automatic generation of reports, pest controllers can work more efficiently and better document their efforts.



Advantage of Digital Pest Monitoring: **Real-Time Monitoring and Notifications**

Real-time monitoring and notifications enable early responses to pest activities. Digital pest monitoring detects pest events in real-time, and the system automatically sends notifications to the responsible individuals. This swift response allows for initiating targeted measures to combat the pests even before they can further spread. Early intervention helps minimize damage and costs.

Furthermore, quality assurance departments increasingly demand to be actively involved in pest monitoring rather than being informed only when issues arise. Real-time monitoring enables them to actively participate in the process and respond quickly to potential pest problems. By being involved from the outset, they can proactively take measures to prevent or address pest infestations early on. This enhances the effectiveness and accuracy of pest control and helps prevent potential negative impacts on the affected areas



Advantage of Digital Pest Monitoring: **Accuracy through Comprehensive Data Collection**

Digital pest monitoring enables detailed data collection and analysis. In addition to capturing pest activities, it can also record environmental variables such as temperature, humidity, and other factors that influence pest growth. Comprehensive data collection allows for the identification of patterns and trends that help in taking preventive measures. Based on the collected data, pest controllers can identify potential risk areas and implement appropriate protective measures to prevent pest infestations from occurring in the first place. This helps save costs and resources on addressing existing pest problems. The accuracy of the data enables informed decision-making and targeted pest control strategies. The data also allows for evaluating the effectiveness of implemented measures and making adjustments as needed, enabling continuous improvement of pest control strategies. The data is centrally stored and accessible at any time, facilitating compliance with regulations and communication with customers and other stakeholders. Additionally, digital monitoring helps uncover negligence since no traps go unnoticed, and inspection results are not missing.

Conclusion

The digital revolution in pest monitoring offers enormous potential to make pest control more efficient and sustainable. By using IoT devices and connected insect monitors and rodent sensors, pest controllers can proactively take action, detect pest infestations early, and reduce the use of biocides. This benefits the environment and minimizes the damage caused by pest infestations.

Furthermore, digitization enables more efficient resource utilization. Automated processes and the elimination of standardized tasks allow pest controllers to focus more on serving their customers and strategically growing their business.

Overall, digital transformation in pest monitoring opens up new possibilities for the industry. By leveraging modern technologies, pest controllers can optimize their workflows, better support customers, and make a positive contribution to sustainability. It's time to seize the opportunities of digitization and steer pest control in an innovative and future-proof direction.

Environmental Protection

- More efficient resource utilization, as targeted interventions based on monitoring data are possible.
- Reduced use of biocides.
- Environmental relief.
- Minimization of damage caused by pest infestations.

Time Savings

- No unnecessary customer visits.
- Reduced effort in evaluating monitoring data.
- Automated capture of pest infestation on adhesive surfaces.
- Less time needed for manual inspections.
- Remote monitoring capability.
- Time flexibility, as digital monitoring can take place around the clock.
- Improved planning of measures due to precise and up-to-date data.

Increased Customer Loyalty

- Faster and more proactive response to pest issues, strengthening customer trust and satisfaction through proactive action before major damage occurs.
- Personalized advice and recommendations based on collected data to offer customers tailored solutions.
- Transparent and traceable documentation of pest control measures, building trust and facilitating audits.
- Strengthening customer relationships through regular communication about the status of pest management and planned actions.
- Customers feel better cared for and supported as digital monitoring enables continuous monitoring and assistance.

About WAINS GmbH

Established as a **joint venture**, WAINS GmbH combines the expertise and resources of two successful companies to take pest control to the next digital level.

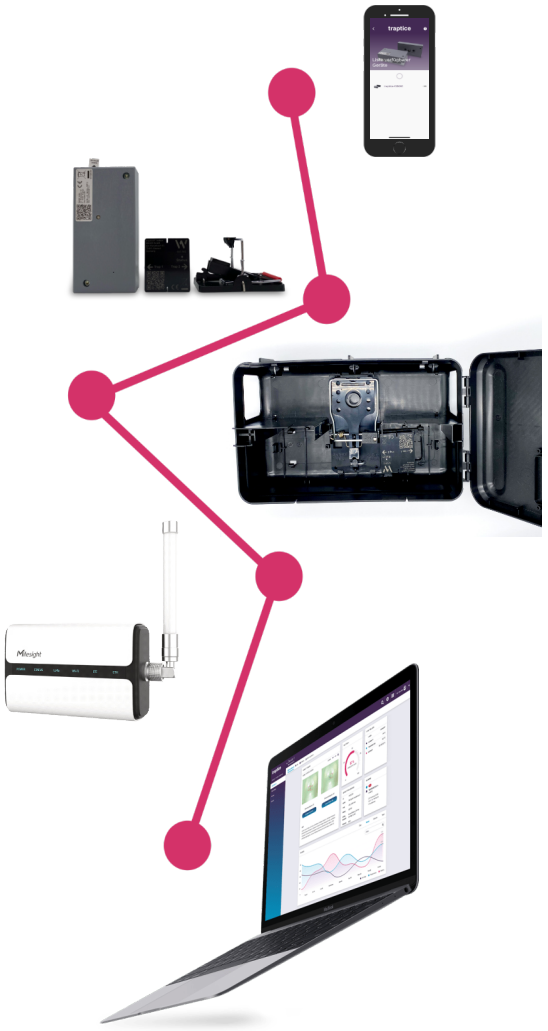
Frowein GmbH & Co. KG, also known as "808," has been synonymous with modern biocides for over 90 years for effective indoor pest control. Professional users find at Frowein all the products that meet the high demands of indoor pest control: insecticides, rodenticides, monitoring systems, and purpose-optimized application devices.

MeetNow! GmbH is an experienced digitalization company that has been supporting the German medium-sized businesses in comprehensive digital transformation for 15 years. With their expertise and the use of innovative methods and technologies, they develop customized solutions for their clients. As pioneers in the IT industry, they actively embrace new technologies and developments such as mobile and cloud-based solutions, artificial intelligence, and IT security.

WAINS GmbH combined the knowledge and technologies of these companies to offer a comprehensive solution for digital pest monitoring. Their product portfolio includes a wide range of digital pest traps, sensors, data analysis software, and management platforms. These solutions enable precise pest monitoring, efficient data analysis, automated alert generation, and integration into existing documentation programs.

Are you interested in a demo or do you have any questions?

Contact us and dive into the fascinating world of IoT solutions.



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